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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/091,994	03/05/2002	Josephus C. Ebergen	SUN-P7023-RSH	6385

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PARK, VAUGHAN & FLEMING LLP
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EXAMINER

INOA, MIDYS

ART UNIT

PAPER NUMBER

2188

DATE MAILED: 07/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/091,994

Applicant(s)

EBERGEN, JOSEPHUS C. 

Examiner

Midys Inoa

Art Unit

2188

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 April 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-14 and 16-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-14 and 16-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 March 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. Claim 14 is objected to because of the following informalities:

On line 4, "re3spect" should be "respect".

Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 3-14, and 16-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakajima (5,269,012) in view of Knauer (4,751,675).

Regarding Claims 1 and 14, Nakajima discloses a stack memory ("linear array") whose push and pop operations allow it to serve as a LIFO memory. In this stack memory, when a write operation is to occur, the data item to be written is presented to the stack. Once this data item is presented to the stack, this particular item is "Pushed" in to the stack by allowing the last empty cell of the stack ("given cell contains no data items") to get the data item from its previous cells, thus allowing the data item to propagate down the stack. This is clearly demonstrated in Figure 2 where write operations occurs by pushing data item "a" down the stack to cell 4 ("coordinate operations with preceding cell in linear array"). In this demonstration, empty cells are allowed to get the data item until the data item sits in the last empty cell. Therefore, the data item would first sit in cell 0, then empty cell 1 would request or get the data item, then empty cell

Art Unit: 2188

2 would request the data item, empty cell 3 would request the data item, empty cell 4 would request the data item, and since cell 5 is full, no further requests would be made, thus leaving the data item in cell 4. This concludes the “push” operation of the LIFO stack memory (Figure 2 and Column 2, lines 25-50). This memory also performs a “pop” operation when a read operation is to occur. In a read operation, a data item is requested and the request is presented to the top of the stack. At this point, being that a data item is being requested and this particular stack provides the “last in” data item first, the last full cell (“the given cell contains no space for additional data items”) would “put” or transfer its data item to the previous empty cell until such data item has been provided to satisfy the data request. This is clearly demonstrated in Figure 3, where a read operation occurs when given cell 4 “puts” data item “a” in previous empty cell 3. Once this occurs, cell 3 (now full), places data item “a” in previous empty cell 2. Cell 2 performs the same operation as cell 3; placing data item “a” in cell 1. Cell 1 performs the same operation as cell 2; placing data item “a” in cell 0. Finally, cell 0, in performing the same operation as its following cells, renders the data item to the requestor, thus satisfying the read request (Figure 3 and Column 2, line 50 – Column 3, line 3). Nakajima does not disclose asynchronous communications between the cells of the array. Knauer discloses a LIFO (or FIFO) memory, which operates asynchronously by allowing access to the cells of a data list in asynchronous fashion (Column 1, line 65 – Column 2, line 2). It would have been obvious to one of ordinary skill in the art at the time the invention was made to **modify the system of Nakajima to operate in the asynchronous fashion of Knauer since doing so allows for faster access time through the avoidance of operation delays (Column 1, lines 24-40).**

Regarding Claim 9, Nakajima discloses a stack memory whose push and pop operations allow it to serve as a LIFO memory. In this stack memory, when a write operation is to occur, the data item to be written is presented to the stack. Once this data item is presented to the stack, this particular item is "Pushed" in to the stack by allowing the last empty cell of the stack ("given cell contains no data items") to get the data item from its previous cells, thus allowing the data item to propagate down the stack. This is clearly demonstrated in Figure 2 where write operations occurs by pushing data item "a" down the stack to cell 4. In this demonstration, empty cells are allowed to get the data item until the data item sits in the last empty cell. Therefore, the data item would first sit in cell 0, then empty cell 1 would request or get the data item, then empty cell 2 would request the data item, empty cell 3 would request the data item, empty cell 4 would request the data item, and since cell 5 is full, no further requests would be made, thus leaving the data item in cell 4. This concludes the "push" operation of the LIFO stack memory (Figure 2 and Column 2, lines 25-50). This memory also performs a "pop" operation when a read operation is to occur. In a read operation, a data item is requested and the request is presented to the top of the stack. At this point, being that a data item is being requested and this particular stack provides the "last in" data item first, the last full cell ("the given cell contains no space for additional data items") would "put" or transfer its data item to the previous empty cell until such data item has been provided to satisfy the data request. This is clearly demonstrated in Figure 3, where a read operation occurs when given cell 4 "puts" data item "a" in previous empty cell 3. Once this occurs, cell 3 (now full), places data item "a" in previous empty cell 2. Cell 2 performs the same operation as cell 3; placing data item "a" in cell 1. Cell 1 performs the same operation as cell 2; placing data item "a" in cell 0. Finally, cell 0, in

Art Unit: 2188

performing the same operation as its following cells, renders the data item to the requestor, thus satisfying the read request (Figure 3 and Column 2, line 50 – Column 3, line 3). Additionally, Nakajima discloses a state of the stack “SP” which denotes which cells of the stack have data stored in them. Being that the SP value is a known value to the system, it acts as a mechanism of knowing which cells in the array are full and which are empty (Column 3, lines 19-27).

Nakajima does not disclose asynchronous communications between the cells of the array. Knauer discloses a LIFO (or FIFO) memory, which operates asynchronously by allowing access to the cells of a data list in asynchronous fashion (Column 1, line 65 – Column 2, line 2). It would have been obvious to one of ordinary skill in the art at the time the invention was made to **modify the system of Nakajima to operate in the asynchronous fashion of Knauer since doing so allows for faster access time through the avoidance of operation delays (Column 1, lines 24-40).**

Regarding Claims 7-8 and 20-21, Nakajima discloses a state of the stack “SP” which denotes which cells of the stack have data stored in them. Being that the SP value is a known value to the system, it acts as a mechanism of knowing which cells in the array are full and which are empty (Column 3, lines 19-27).

4. Claims 3-6, 10-13, and 16-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakajima (5,269,012) in view of Knauer (4,751,675) as applied to claims 1, 9, and 14 above, and further in view of Chen et al. (US 2003/0120879 A1).

Regarding Claims 3, 10, and 16, Nakajima in view of Knauer does not teach dividing each cell of the LIFO stack memory into a master and slave location for storing data items. Chen et al. teaches a linked list queue whose structure is divided into blocks or chunks (“cells”), which

Art Unit: 2188

in turn are divided into two or more data units (“locations”, Page 2, Paragraph 0027). Given that within each “chunk” structure within the linked list queue data is removed from the “chunk” queue at the head and entered into the “chunk” queue at the tail, it can be construed that the last data unit of each chunk acts as a slave unit since it holds new information temporarily until a top data unit has been emptied by a removal operation and thus, the new data is moved up at the event of empty space being available above (“new data item is temporarily stored in the slave location until a preexisting data item in the master location can be moved to... make room for the new data item”, Page 2, Paragraph 0029). It would have been obvious to one of ordinary skill in the art at the time the invention was made to equip the asynchronous LIFO stack memory of Nakajima in view of Knauer with the multi-data unit cells of Chen et al. since having the ability to store more than one data item in each cell would allow the system to reference more data with just one pointer, thus making multiple access operations less cumbersome (Figure 2).

Regarding Claims 4-6, 11-13, and 17-19, Nakajima in view of Knauer does not teach dividing each cell of the LIFO stack memory into a master and slave location for storing data items. Chen et al. teaches a linked list queue whose structure is divided into blocks or chunks (“cells”), which in turn are divided into two or more data units (“locations”, Page 2, Paragraph 0027). It would have been obvious to one of ordinary skill in the art at the time the invention was made to equip the asynchronous LIFO stack memory of Nakajima in view of Knauer with the multi-data unit cells of Chen et al. since having the ability to store more than one data item in each cell would allow the system to reference more data with just one pointer, thus making multiple access operations less cumbersome (Figure 2).

Response to Arguments

Art Unit: 2188

5. Applicant's arguments with respect to claims 1, 9, and 14 have been considered but are moot in view of the new ground(s) of rejection.

Applicant argues that Nakajima in view of Chen does not disclose the movement of signals between cells without reference to an external clock signal. Knauer discloses a LIFO (or FIFO) memory, which operates asynchronously by allowing access to the cells of a data list in asynchronous fashion (Column 1, line 65 – Column 2, line 2

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Midys Inoa whose telephone number is (703) 305-7850. The examiner can normally be reached on M-F 7:00am - 4:30pm.

Art Unit: 2188

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mano Padmanabhan can be reached on (703) 306-2903. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Midys Inoa

Midys Inoa
Examiner
Art Unit 2188

MI

Mano Padmanabhan
7/10/04

**MANO PADMANABHAN
SUPERVISORY PATENT EXAMINER**